

**REMARKS****Status of the Claims**

Claims 1-27 are pending after entry of this paper. Claims 1-4, and 7-27 are withdrawn. Applicant reserves the right to pursue the subject matter of withdrawn claims in a divisional application. Claims 5 and 6 have been amended.

**Amendments to the Specification**

The specification has been amended at page 13, lines 18-27 of the specification to identify a SEQ ID NO for each of the sequences present in FIG. 9. No new matter is introduced by these amendments. Support can be found throughout the specification, claims, and figures as filed.

**Amendments to the Claims**

Claims 5-6, have been amended to recite the phrase “[a]n isolated and purified protein.” No new matter has been introduced by this amendment. Support can be found throughout the instant specification and claims as filed, for example paragraph [0015] on pages 20-21. Additionally, claim 6 has been amended to recite “An isolated and purified protein encoded by a DNA hybridizing with the antisense strand of a DNA encoding the protein according to claim 5 under stringent conditions” and to delete the phrase “consisting of an amino acid sequence where one or several amino acids are deleted, replaced or added in the amino acid sequence shown in SEQ ID NO: 2.” Support for this amendment can be found throughout the instant specification and claims as filed, for example at page 5, line 23 - page 6, line 12.

Response to Rejections under 35 U.S.C. §112

Claim 6 is rejected under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the written description requirement. Applicant respectfully disagrees.

However, in order to expedite prosecution without disclaimer of, or prejudice to, the subject matter recited in the instant application, applicant has amended claim 6 to specifically describe physical and chemical properties as well as functional characteristics of the protein. Specifically, claim 6 has been amended to recite an isolated and purified protein encoded by a DNA, which hybridizes with the anti-sense strand of DNA that encodes the protein of claim 5 (i.e., SEQ ID NO: 2) under stringent conditions and having a regulatory activity of chromosome segregation. The subject of claim 6 is well described by the specification as filed, for example at page 5, line 23 - page 6, line 12. Additionally, applicant asserts that it is well understood in the art that although a few amino acids may be deleted, added, or replaced, the function of the protein is maintained. Applicant thereby believes that the Examiner's concerns have been addressed. Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. 112, first paragraph for non-compliance with the written description requirement.

Response to Rejections under 35 U.S.C. § 101

Claims 5-6 are rejected under 35 U.S.C. § 101 for allegedly being directed to non-statutory subject matter.

In order to expedite prosecution without disclaimer of, or prejudice to, the subject matter recited in the instant application, applicant has amended claims 5-6 to add the phrase "isolated and purified." Support can be found throughout the instant specification and claims as filed, for example paragraph [0015] on pages 20-21. Applicant thereby believes that the

Examiner's concerns have been addressed. Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 101.

Response to Rejections under 35 U.S.C. § 102

Claim 6 is rejected under 35 U.S.C. § 102(e), as allegedly being anticipated by U.S. Application Publication No. (US 2003/0233675) to Cao et al. Specifically, the Examiner contends that Cao et al. discloses SEQ ID NO: 2386, which allegedly is a protein consisting of an amino acid sequence where one or several amino acids are deleted, replace or added in an amino acid sequence shown in SEQ ID NO: 2. Applicant respectfully disagrees. However, in order to expedite prosecution and without disclaimer of, or prejudice to, the subject matter recited therein, claim 6 has been amended to be directed to an isolated and purified protein encoded by a DNA hybridizing with the antisense strand of a DNA encoding the protein according to claim 5 under stringent conditions and having a regulatory activity of chromosome segregation.

Cao et al. relates to DNA constructs, etc. comprising a polypeptide from a microbial source for use in genetic engineering of plants. Cao et al. enumerated 23687 polypeptides as the polypeptides from a microbial source that can be used for genetically-engineered plants, and classified the functions of the peptides using a hierarchical classification tool termed Fun-cat (Functional Categories Annotation Tool) (Paragraph 0086). The polypeptide of SEQ ID NO: 2386 indicated by the Examiner is one of 2226 polypeptides enumerated in Table 10A as a factor useful for improving homologous recombination. This SEQ ID NO: 2386 of Cao et al. corresponds to the sequence where 21 amino acids are inserted in the amino acid

sequence shown by SEQ ID NO: 2 of the present invention between Lys at the 34th position and Lys at the 35th position.

Cao et al. is in fact silent about the function of the polypeptide of SEQ ID NO: 2386 but mention SEQ ID NO: 2386 as a factor for improving homologous recombination, so that even a skilled artisan would be unable to predict from Cao et al. that SEQ ID NO: 2386 is a protein having a chromosome-suppression activity. On the other hand, the protein having a regulatory activity of chromosome segregation of the present invention (SEQ ID NO: 2) is clearly demonstrated to locate only in centromere (*see*: Figure 4 in the specification as filed), and it cannot be contended that SEQ ID NO: 2 is involved in improving homologous recombination. In fact, it has been reported that Shugoshin protein which is a fission yeast is not involved in improving recombination (Kitajima TS et al., *Nature* 427: 510-517(2004) (*see* Information Disclosure Statement and article filed 6/30/06)).

For the forgoing reasons, applicant asserts that Cao et al. does not anticipate the claimed invention. Reconsideration and withdrawal of the §102(e) rejection to claim 6 are respectfully requested.

**AUTHORIZATION**

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. **13-4500**, Order No. 4439-4043.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. **13-4500**, Order No. 4439-4043.

Respectfully submitted,  
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